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10/001,499	11/14/2001	Ligui Zhou	0179.0029	3237

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EXAMINER

MAKI, STEVEN D

ART UNIT PAPER NUMBER

1733

DATE MAILED: 06/02/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/001,499

Applicant(s)

ZHOU ET AL.

Examiner

Steven D. Maki

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 28 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-6 and 8-38 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-6 and 8-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

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- 1) The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

- 2) Claim 24 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 24, there is no antecedent for "the fabric layer of said self-adhesive prepreg". It is unclear if (1) the limitation of "the fabric layer of said self-adhesive prepreg" is being introduced in claim 24 or (2) the limitation of "the fabric layer of said self-adhesive prepreg" is required by a base claim (e.g. claim 1) upon which claim 24 depends or (3) claim 24 merely requires a fiber layer. The description in claim 1 of "at least one fiber layer" instead of --at least one fabric layer-- indicates that *the former is required*. However, applicant's statement that "[a]pplicant amends Claim 24 to more clearly set forth that "said fabric layer" is the fabric layer present in the self-adhesive prepreg according to Claim 1" (page 2 of response filed 2-28-05, emphasis added) indicates that *the latter is required or that claim 24 requires a fiber layer instead of a fabric layer*.

In claim 24, it is suggested to change "the fabric layer of said self-adhesive prepreg comprises" (line 2) to --the at least one fiber layer comprises a fabric layer comprising--.

- 3) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

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the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

- 4) **Claims 1-2, 8-11, 16-18, 21, 23-27, 30-32 and 35-36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi et al (EP 819723, already of record) in view of Recker et al (EP 392348, cited in IDS filed 7-6-04).**

Kishi et al and Recker et al are applied as in paragraph 6 of the last office action (paragraph 6 of the last office action is incorporated herein by reference).

- 5) **Claims 29, 34 and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi et al in view of Recker et al as applied above and further in view of Hayes (US 3530087).**

Hayes is applied as in paragraph 7 of the last office action (paragraph 7 of the last office action is incorporated herein by reference).

- 6) **Claims 3-5, 12-14 and 19-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi et al in view of Recker et al as applied above and further in view of Ghali et al (US 4945154) and optionally Portelli et al (US 5368922).**

Ghali et al and the optional Portelli et al are applied as in paragraph 8 of the last office action (paragraph 8 of the last office action is incorporated herein by reference).

- 7) **Claims 6, 15 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi et al in view of Recker et al and Ghali et al and optionally Portelli et al as applied above and further in view of Hayes et al.**

Hayes et al is applied as in paragraph 9 of the last office action (paragraph 9 of the last office action is incorporated herein by reference).

**8) Claims 9 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi et al in view of Recker et al as applied above and further in view of Maranci et al (US 4957801).**

Maranci et al is applied as in paragraph 10 of the last office action (paragraph 10 of the last office action is incorporated herein by reference).

**9) Claims 28, 33 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kishi et al in view of Recker et al as applied above and further in view of Japan '619 (JP 3-24361).**

Japan 619 is applied as in paragraph 11 of the last office action (paragraph 11 of the last office action is incorporated herein by reference).

#### Remarks

**10) Applicant's arguments filed 2-28-05 have been fully considered but they are not persuasive.**

Applicant argues that Kishi et al's approach to solving the basic problem is completely different from applicant's wherein the basic problem is described by applicant as being that the resins used in self adhesive prepregs for bonding to honeycomb must function both as the prepreg resin and as the adhesive that bonds the prepreg to the core. This argument is not persuasive since Kishi et al's resin composition functions both as the prepreg resin and as the adhesive that bonds the prepreg to the core. In the abstract for example, Kishi et al teaches that the resin composition is for "...a prepreg excellent in self adhesiveness to a honeycomb core ...".

Applicant argues that Kishi et al's approach to solving the problem is completely different from applicant's. The examiner disagrees since Kishi et al teaches a resin composition for a self adhesive prepreg comprising epoxy resin, curing agent and thermoplastic resin soluble in the epoxy wherein the minimum value of resin viscosity during heating is 30 to 400 poise. See page 4 lines 25-34 and page 5 lines 30-34. As examples of preferred thermoplastic resin, Kishi et al identifies polyether sulfone and polyether imide, which directly correspond to (in contrast to being completely different from) the claimed micronized polyethersulfone and polyetherimide. See page 8 lines 27-29 of Kishi et al. Furthermore, Kishi et al's minimum resin viscosity of 30 to 400 poise substantially overlaps (in contrast to being completely different from) the claimed minimum viscosity of 150-1500 poise.

Applicant comments that Kishi et al discloses a laundry list of possible "additives" that might be used to provide a suitable self-adhesive prepreg resin. More properly, Kishi et al expressly teaches using a soluble thermoplastic resin (page 5 lines 29-34) and specifically identifies preferred thermoplastic resins as including polyether sulfone and polyether imide (page 8 lines 27-29).

Applicant acknowledges that Kishi et al's additives play a role in changing the viscoelasticity of the resin composition for optimizing the modulus of storage rigidity, viscosity and thixotropy. Why must viscosity be optimized? Answer: To obtain desired fillet formation for high bonding strength. See page 2 lines 34-38 and more importantly page 5 lines 14-27.

Applicant argues that Kishi et al teaches away from applicant's invention because the fourth version of Kishi et al includes solid rubber and silica particles. Applicant is incorrect since Kishi et al teaches that thermoplastic resin may be used as an alternative to solid rubber or silica. See page 5 lines 29-34, page 6 lines 24-27, page 8 lines 27-29, page 21 lines 31-33. Furthermore, the "... case law does not require that a particular combination must be the preferred, or the most desirable, combination described in the prior art in order to provide motivation for the current invention." In re Fulton 73 USPQ2D 1141, 1145 (Fed. Cir. 2004).

With respect to Kishi et al's third version, applicant comments that components are combined to provide a resin that has a thixotropic index and "viscosities that are within certain ranges". The examiner agrees and adds that Kishi et al teaches that the minimum viscosity is 30-400 poise, which substantially overlaps the claimed range of 100 to 1500 poise. See page 4 lines 25-34 of Kishi et al.

Applicant argues that the teachings of Recker et al are not directed to self-adhesive preregs and should not be combined with Kishi et al. This argument is not persuasive. Kishi et al and Recker et al are in the same field of endeavor of epoxy resin compositions for fiber reinforced preregs for the aerospace industry. Kishi et al and Recker et al are both directed to making fiber reinforced composites having high toughness from the prepreg. Kishi et al and Recker et al both teach using soluble thermoplastic in the epoxy resin composition. Kishi et al and Recker et al both teach using organic particles to improve toughness. Recker et al motivates one of ordinary skill in the art to use differentially soluble thermoplastic (polyether sulfone) particles in

the epoxy resin composition to significantly increase toughness. Recker et al suggests using the differentially soluble thermoplastic particles *in combination with* soluble thermoplastic resin.

Applicant acknowledges that Recker et al teaches using the resin composition as a matrix resin for fiber reinforced prepregs or as a structural adhesive. However, applicant argues that Recker et al does not teach that the resin composition could be used in a self adhesive prepreg as both the prepreg matrix resin and the adhesive for bonding to honeycomb. This argument is not persuasive since Kishi et al teaches using the epoxy resin composition in a self adhesive prepreg for bonding to honeycomb and Recker et al motivates one of ordinary skill in the art to use differentially soluble thermoplastic particles in Kishi et al's epoxy resin composition to significantly increase toughness; it again being noted that Recker et al suggests using the differentially soluble thermoplastic particles *in combination with* soluble thermoplastic resin.

Applicant argues that in view of the unpredictability described by Recker et al, it is doubtful that one of ordinary skill in the art would consider using the disclosure in Recker et al to modify the composition of Kishi et al. This argument is not persuasive since (1) the unpredictability of using broad classes of thermoplastic (e.g. polyamideimides, polybutyleneterephthalate, polyolefins) in a base resin (e.g. maleimide, phenolic) is not at issue, (2) Kishi et al and Recker et al use the same base resin (i.e. epoxy), (3) Recker et al discovered that the addition of 2-35 micrometer particles of a differentially soluble engineering thermoplastic (polyether sulfone) into heat curable epoxy resin significantly increases the toughness, and (4) Recker et al



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teaches that the differentially soluble particles may be used *in combination with* soluble thermoplastic resin. The claimed fillet forming particles read on Recker et al's 2-35 micrometer particles of a differentially soluble thermoplastic (polyether sulfone) for increasing toughness.

Applicant comments on the discovery that certain types and sizes of thermoplastic particles may be used as fillet forming particles to make the prepreg self adhesive while not adversely affecting viscosity. In response, the examiner comments that claim 1 specifies neither the types nor the sizes of the thermoplastic particles which are used as fillet forming particles.

Applicant argues that the fillet forming particles dissolve during the curing process to provide the resin with adhesive characteristics that enhance fillet formation between the prepreg and honeycomb and provide toughening of the resin. No unexpected results over the applied prior art has been shown. First: The claimed invention has not been compared to Kishi et al since none of the comparative examples use viscosity control agent but not thermoplastic fillet particles. Second: Kishi et al teaches using a minimum viscosity of 30-400 poise to obtain desired fillet formability. See page 5 lines 14-28. Third: The use of thermoplastic particles which are not substantially dissolved in the prepreg resin to improve toughening is the expected results. See abstract of Recker et al. Fourth: The results in the specification are not commensurate in scope with the claims since the examples in the specification, but not the claims, require specific amounts *and types and sizes* of thermoplastic fillet forming particles.

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11) No claim is allowed.

12) Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action (the new 112 second paragraph rejection for amended claim 24).

Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.


13) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 7:30 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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May 26, 2005

  
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